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MEMOIR OF SAMUEL F. TROTH.

(Read at a meeting of the Board of Trustees of the College, February 1, 1887,)

Samuel Forthergill Troth—an old and esteemed member of this College—deceased at his residence, 1019 Cherry Street, on the 18th of November, 1886, in the eighty-sixth year of his age.

The life of Samuel F. Troth, commencing near the advent of the present century, extended through a period of years which have revolutionized old customs in business, by the introduction of steam and electricity as factors in common use. Retaining an unclouded memory of the past, and continuing his interest in the advancement of pharmacy to the close of a long life, he has been affectionately regarded as a connecting bond between the present and the early history of the drug business in Philadelphia.

The ancestors of Samuel F. Troth were members of the Society of Friends (Quakers) who emigrated from their homes in England, on account of persecution, and sought, in the colony founded by Lord Baltimore, that freedom in the enjoyment of their customs and mode of worship which was denied them in their native land.

Samuel F. Troth was the youngest child of Samuel and Ann Berry Troth; he was born while his parents resided on a farm near Easton, in Maryland, May 7, 1801.

In early life—as a child—he possessed a gentle and amiable disposition, qualities which gave him an influence over his boyhood companions, among whom he acquired the title of "the little peace-maker." During the course of a long life this trait of early character never deserted him, and in his manhood men acknowledged the perception of the boys.

The father of Samuel F. Troth appears to have been a man whose intellectual necessities were not satisfied by the routine of a farmer's life; when Samuel was about five years old he removed to the town of Easton and opened a school, which was continued by him until his death in 1815.

To a delicate and sensitive boy of fourteen, carefully nurtured in religious thought and habits after the custom of the Society of Friends, the loss of his father produced a profound impression, and confirmed in him a reliance in a supervision beyond his own to direct and protect his course through life.

In the summer of 1816 he accompanied his mother to Philadelphia on a visit to relatives residing in this city, intending to return after a few weeks to his home in Maryland. An unexpected event, however, changed his course, and shaped the business career of his life. His elder brother, Henry Troth, with his brother-in-law, Edward Needles, had entered into a partnership for conducting a wholesale and retail drug business, on the south side of Market Street east of Seventh.

Samuel had not shown any inclination or desire for the business; but as he was about to leave the city, the earnest desire of his brother Henry, that he might be with him, prevailed over his inclinations for another pursuit, and he consented to remain as an apprentice to the drug business with the firm. His great regret in thus early accepting the position was that it deprived him from farther opportunities of school education.

As was the custom in those days, the store and the dwelling were under the same roof, the change from a rural home to the close confinement of the store was severely felt by the slight and delicate boy of fifteen.

With his natural cheerfulness, he assumed his new duties with a determination to acquire the knowledge which would make him a master of his business, and also to supply, as far as possible, the loss sustained in leaving school, by a course of reading and study, and by availing himself of the opportunity of attending such lectures as would advance his general education.

His duty was to have the store open at sunrise, and the labors of the day did not close until ten at night; the opportunities for study, under such circumstances, were limited to the hours given for recreation, and at night in the store. After the fatigue of the day's work, he said he was so weary that if he sat down to read he was apt to

become sleepy, and on that account adopted the habit of standing up to read or study.

While an apprentice he was much interested in the endeavors of his brother Henry, and other prominent druggists, which lead to the founding of the Philadelphia College of Pharmacy in 1821. He attended the first course of lectures given in the college in 1821–22, as also the second course in 1822–23. Although regulations were adopted by the Trustees of the college in December, 1822, in reference to conferring a diploma on graduates of the college, a draft of a form for the diploma was not presented until February, 1826, notice was given in May following that an examination would be held on the last Monday in June, at which time applicants for graduation were to present themselves. Three names were reported to the Trustees, upon whom the title of "Graduate in the Philadelphia College of Pharmacy" was conferred. Diplomas were directed to be engrossed for these. In June, 1828, a copper plate for the diploma, with an impression from the same was presented at a meeting of the Trustees by a committee to whom the subject had been referred.

The foregoing sketch of the history of the college will explain the cause of the name of Samuel F. Troth not being found among the graduates of the institution; as an active member, and for a long course of years one of the trustees of the college, his interest in its prosperity was evidenced by his untiring exertions to promote its stability and usefulness.

Soon after attaining his majority, he became the junior partner in the firm of Henry Troth & Co. A few years later Edward Needles withdrew from the firm, preferring to be engaged in the retail and dispensing business. Selecting the location at the S. W. corner of Race and Twelfth Streets, he built a store which for more than sixty years was conducted under the same name.

The friends of Edward Needles expressed surprise that he should have gone so far out of town, and called him the frontier druggist. The opposite side of Race street, above Twelfth street, was then an open field, enclosed only by a post and rail fence. The foresight of the "frontier druggist" was soon made apparent by the rapid growth of the city in that direction.

By careful economy the brothers Troth were able, in 1836, to purchase the lot adjoining them on the west, and erected the building, No. 224, old number, afterwards changed to No. 630 Market street.

This was said to be the first five story store on Market street used exclusively by one firm in their business, and although soon surpassed by buildings of greater pretentions, it created much comment at the time.

The character of the drug business then was very different from its present condition; for the greater part of manufactured articles the market was dependant upon importations, chiefly from Great Britain.

He took great interest in the progress of chemical manufacturing in Philadelphia, and often referred to his satisfaction in being able to obtain these products from the laboratories of our own city, then in their infancy, but afterwards to become so well renowned for the excellence of their preparations.

The firm of Henry Troth & Co., received the first large shipment of petroleum, called at that time Seneca Oil, made to this city; this consignment of eight or ten barrels was considered by their friends as a venturesome risk; they were, however, able to dispose of it for use as a medicinal agent, its value for other purposes remaining for future discovery.

In the spring of 1842, Samuel F. Troth met with a severe affliction in the death of his brother Henry. For himself he had not anticipated a long life, and the decease of his brother so much more active and vigorous than himself, was unexpected. Sorrow and the anxieties connected with the business which now rested alone on him, were telling upon his health which was not robust; his medical adviser, Dr. Theophilus Beesley, to whom he applied for advice, informed him that he had no physical ailment needing medicine, and advised him to endeavor to throw aside the depression of spirit, and the care of business on leaving his store, by having at home some interesting book from which to read aloud to his family during the evenings. This moral treatment was found to be of great benefit to his health, and proved a lasting pleasure to the home circle where it was continued for more than forty years.

A few years after the death of his brother, he took into partnership his nephew, William P. Troth, and afterwards, Henry M. Troth, both sons of his brother Henry.

In 1853 his health made it necessary for him to retire from active participation in business, and at the earnest solicitation of his family he relinquished the drug business to his nephews.

His active mind could not settle down into inactivity, and as far as his strength would permit, he exerted himself in works designed for the benefit of others.

The Apprentices' Library, and the Philadelphia College of Pharmacy, were two institutions which enlisted a large share of his earnest interest. His own experience created a deep sympathy for those who were obliged in early life to depend upon their own exertions; to young strangers, especially, coming to a large city, he was ever ready to give advice and assistance.

Increasing years, and decreasing strength, made it at last necessary for him to relinquish all the duties which had so long been an attraction to him. His mind retained its clearness of perception, and his interest remained unabated in all affairs relating to the well-being of his fellow men. At the age of 85, he was frequently requested to furnish statistical and other information on important subjects, and was able to do so with great clearness.

In 1874, he furnished an interesting article for the American Journal of Pharmacy, on "Pharmacy Fifty Years Ago," and in 1879, an article on "The Early Price of Quinia."

He was elected a member of the Philadelphia College of Pharmacy in 1822, and served the college as its Treasurer from 1838 to 1842, when he resigned that position, and was elected a Trustee, remaining in the Board of Trustees nearly the whole of his subsequent life. In 1845, he was made Vice President of the college, and continued as such until his failing health induced him to decline its continuance.

The dignified simplicity of his manner, the cheerful and open expression of his countenance which evinced the kindly sentiments of his heart, were well calculated to attract and gain the confidence of all who sought his counsel, and to endear him to all his acquaintance and personal friends.

While a consistent member of the Society of Friends, he manifested an unsectarian interest for all holding the doctrines of Christian faith.

Until within a few days of his death, he was able to occupy his accustomed place in the family circle; after an illness of five days, unaccompanied by suffering, he closed the record of an honored and useful life.

C. B.

BISMUTH OXYIODIDE.

By Frank X. Moerk.

(Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.)
Read at the Pharmaceutical Meeting, February 22nd.

The processes published in the Am. Journ. of Pharm. December, 1886, and January, 1887, for the preparation of bismuth oxyiodide are supposed to yield a product having the formula BiOI.

Both methods advocate the use of considerable mineral acid; that of Mr. C. Mayo, hydrochloric, and that of Mr. Jos. W. England, nitric acid. Both products are mixtures of bismuth oxyiodide—with oxychloride in the former, and oxynitrate in the latter case.

It occurred to me, on reading the papers above referred to, that a pure oxyiodide might be made by boiling together oxynitrate of bismuth and potassium iodide, according to the reaction:

$$BiONO_3 + KI = BiOI + KNO_3$$
$$288 \quad 165{\cdot}6 \quad 352{\cdot}6 \quad 101$$

The two salts, dried at 120° C., were taken in molecular ratio —10 gm. of the former, 5·75 gm. of the latter—and boiled with 50 cc. water for half an hour. The color of the oxynitrate at once changed to a yellow, and rapidly passed into a brick-red. It is not necessary to boil the mixture in order to get the brick-red precipitate, since the reaction also takes place in the cold, although much slower, requiring several hours for its completion. The precipitate was transferred to a weighed filter and washed with boiling water until the washings ceased to produce turbidity with silver nitrate. It was then dried at 120° C., and weighed. The weight was 11·490 gm.—deficient, as the theoretical yield is 12·243 gm.

The filtrate, proven to be free from Bi, contained a large quantity of potassium iodide, which on estimation by precipitation with silver nitrate and weighing as AgI, proved to be 33 per cent. of the amount of potassium iodide taken, indicating that only two-thirds of it entered into the reaction. The product contained oxynitrate, the detection of which in the presence of an iodide is rather difficult, and is best determined by reducing the nitric acid to ammonia by generating H from Zn and H_2SO_4 and liberating NH_3 by adding KOH. The purity of the compound was established by igniting 2 gm. until the oxide, Bi_2O_3, which results on ignition in air, ceases to lose weight. This cannot be accomplished by heating with a Bunsen burner, as some of the iodine is still retained after several hours' heating. By the use of a blast-lamp, after heating with a Bunsen burner, additional vapors of iodine are evolved, and the residue, only after complete fusion, ceases to lose weight. The amount of Bi_2O_3 was 1·414 gm., or 70·70 per cent.

The Bi_2O_3 yielded by BiOI is equal to 66·36 per cent.; therefore, the compound is not pure BiOI as previously indicated by the detec-

tion of nitric acid. The excess of Bi_2O_3, 70·70—66·36 or 4 34 per cent., is due to the presence of an equivalent quantity of $BiONO_3$, which gives 81·25 per cent., Bi_2O_3.

The salts used in the preparation were carefully tested for impurities and were found to be pure, so that $BiONO_3$ is the only possible contamination.

From the percentages of oxides can be calculated the percentage of BiOI and $BiONO_3$ in the compound.

A=1 part of the preparation.

B=Bi_2O_3 from one part 0·707

I=Bi_2O_3 " " " BiOI 0·6636

N=Bi_2O_3 " " " $BiONO_3$ 0·8125

x and y represent unknown quantities of $BiONO_3$ and BiOI respectively. Then x+y=A and

$x=\frac{B-I}{N-I}$ or 0·2914=29·14 per cent. $BiONO_3$

y=A—x or 0·7086=70·86 per cent. BiOI.

By dividing the percentage composition by the molecular weights of the salts, the figures 1·01 and 2·009 are gotten, showing that the compound is composed of one molecule $BiONO_3$ and two molecules BiOI. This explains for only two-thirds of the potassium iodide taken entering into the reaction, which can now be written,

$$\underset{864}{3\ BiONO_3} + \underset{331{\cdot}2}{2\ KI} = \underset{993{\cdot}2}{BiONO_3(BiOI)_2} + \underset{202}{2\ KNO_3}, \text{ and}$$

by a calculation as to the yield of $BiONO_3(BiOI)_2$ from 10 gm. $BiONO_3$ there is gotten 11·495 gm. The quantity obtained (Specimen A2) was 11·495 gm., agreeing with the above figures.

The above reaction occurs, no matter how great the excess of KI used, and if the resulting product be thoroughly washed and boiled with an additional quantity of KI, it only slightly deepens in color (Specimen A3), without assuming the color and crystalline form so characteristic of pure BiOI.

Thinking that BiOI could be made by the first reaction when carried out under pressure, the following experiments were made:

1. 5 gm. $BiONO_3$ and 2 gm. KI with 10 cc. water,
2. 5 gm. $BiONO_3$ and 3 gm. KI with 10 cc. water,
3. 5 gm. $BiONO_3(BiOI)_2$ and 3 gm. KI with 10 cc. water

were heated in sealed tubes for two hours at a temperature of 150° C. On examining the products, they were not found to differ from those

gotten by carrying out parallel experiments under normal pressure. These sealed tube experiments were not made until BiOI had been obtained by methods to be described further on.

The medicinal virtues attributed to the oxyiodide of bismuth really belong to mixtures of oxyiodide and oxynitrate, pure oxyiodide of bismuth having as yet not been used in medicine. A formula is given for the preparation of $BiONO_3(BiOI)_2$, with the advantages of the product.

Bismuth subnitrate,	10 gm.
Potassium iodide,	4 gm.
Water,	50 cc.

Boil for 30 minutes, filter and wash the precipitate until the washings no longer produce turbidity with solution of silver nitrate. Dry, first by pressing between bibulous paper, and then at 120° C.

The advantages of this product are: First, the avoidance of free acid; Second, its definite composition; Third, a higher percentage of BiOI than is obtained by either of the published processes.

A specimen is presented which was made by boiling the above quantities for only a few minutes, the composition of which is $BiONO_3$ 44·59 per cent., BiOI 55·41 per cent., showing an incomplete change. It may here be stated that the percentage of $BiONO_3$, in specimens gotten by the above process, can be determined by subtracting 66·36 from the percentage of Bi_2O_3, multiplying by 100 and dividing by 14·89.

Having failed in the above experiments, as far as the preparation of a pure oxyiodide of bismuth is concerned, attention was now paid to the action of potassium iodide on bismuth oxycarbonate. The two salts can be boiled together for a long time without reaction. If to the mixture acetic acid be added, effervescence takes place, the color rapidly changes to a red-brown and on continued boiling the salt becomes crystalline. The compound in this case is not definite in composition, from 60 to 80 per cent. of the oxycarbonate being changed into oxyiodide. If the compound so gotten be thoroughly washed and then boiled a second time with potassium iodide and acetic acid, effervescence again occurs and the color of the precipitate becomes darker (Spec. B1.) This on analysis—by ignition 67 per cent. Bi_2O_3 is obtained—contains 98 per cent. BiOI. When this is boiled with KI and acetic acid, a product (Spec. B2) is gotton, leaving 66·50 per cent. Bi_2O_3 on ignition, corresponding to 99·50 per cent. BiOI.

The process is a tedious and expensive one, and is only given to prove that the repeated action of KI and $HC_2H_3O_2$ on $(BiO)_2CO_2$ will give a pure oxyiodide.

The pure salt, BiOI, was obtained by the action of HI on $(BiO)_2CO_3$. Hydriodic acid was made by the action of H_2S on I, in presence of water; after the complete conversion of I into HI, the solution is boiled until the aqueous vapor no longer darkens acetate of lead paper. To this solution is then added the oxycarbonate in small consecutive portions. It is first dissolved to a yellowish-red solution, CO_2 being liberated, and then on further addition there is precipitated the normal iodide BiI_3. This is changed by boiling with the $(BiO)_2CO_3$ into BiOI. There is no difficulty in avoiding an excess of the oxycarbonate if the color of the supernatant liquid be watched, for as long as it is colored there is present free hydriodic acid. The addition of $(BiO)_2CO_3$ must cease as soon as the liquid assumes a pale yellow color (Spec. C1). The product yields 66·40 per cent. Bi_2O_3. The reactions are as follows:

$$2\ H_2S+2\ I_2=4\ HI+S_2.$$

$$(BiO)_2CO_3+6\ HI=2\ BiI_3+3\ H_2O+CO_2.$$

$$BiI_3+(BiO)_2CO_3=3\ BiOI+CO_2.$$

Every atom of iodine is converted into one molecule of BiOI. To make, for example, 30 gm. BiOI, 10·77 gm. iodine and 22·55 gm. oxycarbonate of bismuth are required. For the preparation of it, there may be taken one part iodine and two parts oxycarbonate, which will give almost three parts BiOI. The preparation thus obtained has a copper-red or chocolate color, is crystalline, soluble in strong HCl without liberation of I; HNO_3 liberates iodine, forming $Bi(NO_3)_3$. Dilute acids decompose it, forming BiI_3 and the corresponding salt. The action of dilute sulphuric, for instance, is:

$$3\ BiOI+3\ H_2SO_4=BiI_3+Bi_2{}^3SO_4+3\ H_2O.$$

BiOI was obtained by Schneider (Watts' Dictionary) by heating BiI_3 in air. It can also be obtained by boiling the normal iodide with a large excess of water. $BiI_3+H_2O=BiOI+(HI)_2$. This is a costly method, as two-thirds of the iodine present is liberated as hydriodic acid, holding in solution some of the bismuth. (Spec. C2.)

A sample of oxyiodide (Spec. C3) is presented, made by concentrating the hydriodic acid, liberated as above, and adding oxycarbonate.

The three specimens of pure oxyiodide are identical in appearance and properties. C1, however, is in larger crystals, due perhaps to the fact that the hydriodic acid used was more concentrated than that from which Spec. C3 was prepared.

It may be of great interest and importance to know if pure oxyiodide of bismuth has properties similar to those possessed by mixtures of oxyiodide and oxynitrate, or if the virtues possessed by the mixtures depend on the presence of oxynitrate.

ANALYSIS OF HYDRANGEA ARBORESCENS.

By C. S. Bondurant.

Read at the Pharmaceutical Meeting, February 22.

This indigenous plant grows abundantly in a large section of the United States. Considerable quantities are furnished to the market from Ohio and Indiana. Hydrangea is well known by its vernacular name "Seven Barks," and is said to have been used by the Cherokee Indians and subsequently by more scientific practitioners, some of whom regarded it as a specific in treatment of urinary calculi.

As far as I am able to learn hydrangea has received but little attention as to its proximate constituents.

The first analysis was probably that of Mr. Jos. Laidley, of Richmond, Va., in 1850. He mentions having found only gum, starch and resin.

The Amer. Jour. of Phar., of April, 1881, p. 157, contains an essay by Mr. Jacob Baur, Ph. G., who claims to have found in addition to gum, starch, resin and sugar, an alkaloid in small quantity and tannin, also a crystallizable body, but was unable to separate a sufficient amount to determine its character.

In following the scheme outlined by Dragendorff, for plant analysis, I found a distinctly crystalline body in both alcoholic and ethereal extracts, the latter containing the largest quantity. Its extraction and purification was attended with much difficulty, owing to the fact of its readily undergoing decomposition, which was accompanied by a resin-like body, possessing an odor entirely different from that characteristic of the drug.

A portion of the body, distinctly crystalline and freed from decomposition products, by solution and recrystallization from ether, was examined as to its chemical relations. The alkaloidal reagents were applied, none of which gave any evidence of alkaloidal character. After boiling an aqueous solution of the body with dilute hydrochloric acid and neutralizing with potassium hydrate, Fehling's solution was promptly reduced. Its behavior to Fehling s solution and the proneness to decomposition into the resin-like body and glucose, are sufficient evidence of its being a glucoside.

In order to obtain a larger quantity 500 grams of the drug were prepared and percolated to exhaustion with 95 per cent. alcohol. The greater portion of the alcohol being recovered by distillation, the concentrated extract was allowed to evaporate spontaneously, which left a viscid brownish red mass. After shaking with petroleum spirit to remove a fixed and volatile oil, the residue was treated with a slightly acidulated water and chloroform to remove the red coloring matter. The acidulated solution was shaken with ether several times, the ethereal washings on evaporation deposited the body in stellate clusters in fair state of purity.

CRYSTALS OF HYDRANGIN (Natural Size).

After confirming its glucosidal character, the name *hydrangin* is proposed for it. On addition of an alkali to the aqueous solution a very distinct and strong opal blue fluorescence is observed, which is destroyed in acidifying. This characteristic fluorescent property was noticed in all the solvents used in exhausting the drug except the petroleum spirit and dilute hydrochloric acid.

From its fluorescent property it was thought to be similar to or identical with æsculin, a glucoside prepared from horse chestnut, but on comparison they were found to be distinct bodies. The fluorescence of hydrangin is opal blue, while that of æsculin is sky blue. Hydrangin also differs from æsculin by its ready solubility in ether, its insolubility in strong hydrochloric acid and by its not being precipitated by argentic nitrate, mercuric chloride, nor neutral lead acetate. Hydrangin is not charred by concentrated sulphuric acid, but dissolves without color; also with nitric acid. A characteristic reaction for hydrangin is obtained on dissolving it in sulphuric acid and adding a small crystal of potassium bichromate when a dark purple color is produced which, after some minutes, fades to violet; and on addition of a few drops of water an olive green is produced which gradually fades.

Hydrangin melts at 235° C. and on increasing the temperature slightly, sublimes without decomposition, forming in stellate clusters,

without color. It was desired to make an ultimate analysis of hydrangin, but owing to lack of time it will be reserved for future investigation.

In exhausting the drug with the usual solvents, there was found in the petroleum spirit extract, a fixed oil, turning dark reddish-brown with concentrated sulphuric acid, saponifiable with potassa; and a volatile oil possessing the characteristic odor of the drug and evolving an alliaceous odor when treated with caustic potash and sulphuric acid. The presence of sulphur was indicated by the blackening of paper moistened with solution of lead acetate.

The ethereal extract contained in addition to the glucoside, a resin insoluble in water, sparingly soluble in chloroform, completely soluble in absolute alcohol and alkaline solutions.

Absolute alcohol extracted the glucoside, a resin insoluble in ether, and a reddish coloring matter soluble in chloroform.

Water extracted vegetable mucilage, saponin and sugar.

The dilute soda solution contained mucilaginous substances and albuminoids.

Dilute hydrochloric acid extracted calcium oxalate in small quantities.

The residue boiled with dilute hydrochloric acid for some hours extracted starch by conversion into glucose.

Lignin was extracted by chlorine water with agitation.

The ash was found to be composed of sulphates, chlorides, carbonates, phosphates and silicates combined with calcium, iron, aluminium, magnesium and potassium.

SUMMARY:

Petroleum spirit (fixed and vol. oil).	2.28	per cent.
Stronger ether (glucoside and resin).....	1.57	"
Absolute alcohol (glucoside and two resins).....	2.31	"
Distilled water (mucilage, saponin and sugar).....	9.52	"
Dilute soda (mucilage and albuminoids).....	8.37	"
Dilute hydrochloric acid (calcium oxalate).....	1.40	"
Starch,.....	7.28	"
Lignin,.....	4.83	"
Ash,.....	3.41	"
Cellulose moisture, etc., undetermined,.	59.03	"
Total,	100.00	

No tannin was found to be present in the drug contradictory to statement made by Mr. Baur. The work above was done in the laboratory of the Philadelphia College of Pharmacy, under direction of Prof. Henry Trimble.

EXAMINATION OF CHIMAPHILA UMBELLATA.

By E. S. Beshore.

Read at the Pharmaceutical Meeting, February 22.

The leaves of Chimaphila umbellata, *Nuttall.* Nat: Ord: Ericaceæ, Pyroleæ.

Chimaphila umbellata is indigenous to North America, Northern Asia, and Northern and Central Europe, is found in dry woods and flowers in June and July.

Moisture.—The amount of moisture was found to be 7.83 per cent.

Ash.—Upon ignition, the leaves yielded 4.04 per cent. of ash.

Treatment with Petroleum Spirit.—The leaves freed from the accompanying stems, were reduced to a No. 80 powder, and 50 gm. of the powder was exhausted by petroleum spirit, boiling point 45°C. The liquid was concentrated to a definite volume, to ascertain the percentage soluble in this menstruum, which was found to be 3.92 per cent.

Crystalline Principle.—The remaining liquid was allowed to evaporate spontaneously; when the extract became concentrated, to about 200 cc. I noticed a white crystalline principle separating and collecting at the bottom of the beaker. After concentrating to about 75 cc. I separated the extract from the crystals by decantation, as they were then yet practically free from impurities; and after trying various methods to obtain them in an entire state of purity, I adopted the following method:

Treated them with 90 per cent. alcohol, to remove traces of adhering chlorophyll, followed by treatment with absolute alcohol, and finally by dissolving in boiling chloroform, when, upon cooling, the crystals will separate in a state of purity.

With a view of making a further investigation of this crystalline principle, two and a half kilos of the drug were percolated with petroleum spirit, which, after purification, yielded a sufficient amount of crystals to make two ultimate analyses with the following results, which indicated a formula very close to $C_{10}H_{19}O$.

	Found.		Calculated percentage for
	1st.	2nd.	$C_{10}H_{19}O$.
C	77·87	77·67	77·42
H	12·14	12·21	12·90
O	9·99	10·32	10·32

The crystals melt at 236° C. (difference from urson which melts at 190° C.); they can be sublimed at a temperature below the melting point if the heat is applied long enough, and they finally carbonize at 278° C. They are sparingly soluble in cold or boiling 90 per cent. alcohol, sparingly soluble in absolute alcohol, stronger ether, benzol, chloroform, and glacial acetic acid, and precipitated on diluting with water; more freely soluble in hot glacial acetic acid. Bromine has a decided action on them and appears to form bromine derivatives.

When pure they do not give any color reaction with nitric acid, (difference from urson), but slowly dissolve in the acid. Strong sulphuric acid does not carbonize them, nor is the acid colored, which will serve as a chemical test by which they may be distinguished from urson, the latter being carbonized by strong sulphuric acid, and the acid colored red. Like urson, they are tasteless and odorless, when pure. They are not well crystallized from stronger ether. The most perfect crystallization may probably be obtained from a solution in chloroform.

I also distilled with water, some leaves of chimaphila, practically free from stems; upon shaking the distillate with petroleum spirit, and evaporating the latter, golden-yellow, flaky crystals were obtained, the yellow appearance probably due to impurities; these crystals are freely soluble in chloroform, alcohol and ether, insoluble in water, colored blood red by sulphuric acid, the color being changed on the addition of bichromate of potassium to yellow, then green, which appears to be permanent; on the addition of nitric acid the blood red color is changed to yellow. Upon distilling with water the stems, the same principle was obtained.

This compound, obtained by distillation, was first made mention of by Mr. Samuel Fairbank (in the Journ. and Trans. of the Md. Col. of Pharm., March, 1860), but it appears to be distinct from the one obtained by the action on the drug with petroleum spirit, in the following respects:—1st. In their physical properties, the crystals being of yellow and flaky appearance and freely soluble in most simple solvents; on the other hand, those obtained by the action on the drug with petroleum spirit are purely white, and the crystals have an acicular appearance. 2d. In the chemical behavior they differ by forming color reactions with sulphuric acid, with sulphuric acid and bichromate of potassium, and with sulphuric followed by nitric acid. Those obtained by the action on the drug with petroleum spirit do not produce any color reaction with the above reagents.

A READY METHOD FOR THE ASSAY OF LAUDANUM.

By Charles Bullock.

The resinous matter taken up by dilute alcohol from opium presents an obstacle in the determination of the morphia contained in the tincture. The following simple process was found to work well, and gave satisfactory results.

The tincture is evaporated on a water bath at a low heat to about one-fourth of its volume, to the fluid extract thus obtained pure kaolin is stirred in until a thick paste is formed; water is then added gradually with constant stirring to make an homogeneous mixture; this is transferred to a wet filter and after the liquid has drained through, the contents of the filter are washed with water until the filtrate is clear and without bitterness.

The solution first draining through the filter is set aside, and the washings are evaporated on a water-bath, and added to the reserved portion. The separation of the morphia is then effected after the process of Dr. E. R. Squibb.

The kaolin separates the resinous matter in a finely divided condition and permits the soluble salts to be washed out without difficulty.

GLEANINGS FROM FOREIGN JOURNALS.

By Geo. H. Ochse, Ph.G.

Eugenol as an antiseptic.—Eugenol the principal component of oil of cloves is found also in Myrtus Pimenta (Pimenta officinalis, *Lindley*), Amomis acris, *Berg* (Myrcia acris, *DeC.*), Canella alba, *Murray*, Dicypellium caryophyllatum, *Nees*, and in Ravensara aromatica, *Sonnerat.* Eugenol $C_{10}H_{12}O_2=C_6H_3\begin{cases}OCH_3\\OH\\CH.CH.CH_3\end{cases}$—a phenol-like compound, is insoluble in glycerin and water and is obtained as residue when oil of cloves is subjected to distillation with strong caustic alkalies. After the so-called light oil of cloves is distilled off, sulphuric or phosphoric acid is added and by continuing the distillation without access of air, eugenol is obtained. Eugenol is an oily, colorless liquid, possessing the odor and taste of oil of cloves in the highest degree. In contact with air and light it soon acquires a brown color; it boils at 247·5° C. and has a specific gravity of 1·078 at 0 and 1·063 at 18·5°

C. Like phenol, which it resembles very much, it has no acid reaction, does not contain the group COOH and also forms crystallizable compounds with alkalies. When heated with hydriodic acid it evolves methyl-iodide, and when fused with potassium hydrate, it forms protocatechuic acid $C_6H_3(OH)_2COOH$, with baryta and tin-dust it forms about 10 per cent. methyl-eugenol. When taken internally the greater part of it is eliminated by the urine, in which however it cannot be detected by its odor nor by distillation, but, if allowed to decompose, the characteristic odor is at once perceptible, and when extracted with alcohol shows the characteristic deep-green coloration with ferric chloride. Eugenol has been given in doses of 3 grams per day dissolved in alcohol and diluted with water. As an antiseptic, it is superior to phenol; as a febrifuge, it is not as efficacious as quinine, salicylic acid, antipyrine or thalline.—*Phar. Zeitschrift für Russland*, xxv, page 723.

Preservation of ferrous sulphate.—To preserve ferrous sulphate—crystalline or precipitated—Gawalowski places in the salt an epouvrette half-filled with an alkaline solution of pyrogallic acid. The epouvrette is placed in such a way that the opening is sufficiently above the salt. With a good stopper, ferrous sulphate can be kept from two to three years.—*Ibid.*, xxv, page 759.

Iodoform pencils:—I. Iodoform powdered 50, starch (or gum arabic) 5, distilled water 9·5; make pencil 8 centimeters long and 4 millimeters thick. II. Iodoform powdered 5, starch or gum arabic 6, glycerin 9·5; make a pencil 6 centimeters long and 1 centimeter in thickness.—*Ibid.*, xxv, page 760. See also Am. Jour. Phar., 1885, page 30.

Naphthalin as a vermifuge.—Koriander gives children from 1 to 3 years old 0.15 to 2.0 grams twice daily; to adults he gives from 1.25 to 6.0 grams per day in powders with sugar. Koriander has frequently noticed excellent results from naphthalin when given for tapeworm.—*Phar. Zeitsch. für Russl.*, xxv, page, 786.

Impervious Shoe Blacking.—Wax 10, spermaceti 6, oil of turpentine 66, asphalt varnish 5, pulverized borax 1, nitrobenzol 1, grape-vine charcoal 5, Berlin blue 2. Melt the wax, add the borax and stir until a jelly is formed. In another vessel melt the spermaceti, add the asphalt varnish previously mixed with the turpentine, stir well and add to the wax, lastly add the coloring previously mixed with a small quantity of the mass, perfume with nitrobenzol and fill in boxes. Apply a small quantity with a rag and brush. To be used only once a week.—*Ibid.*, xxv, page, 792.

Paraffin Oil is said to be a new adulterant for cod liver oil. It can be recognized by saponification, paraffin does not saponify.—*Ibid.*, xxv, page, 792.

Antipyrine as a styptic.—Henocque and Huchard have used antipyrine for bleeding from the nose and on wounds on the hand and fingers. They applied 0.5 grams by dusting on the wounds.—*Archiv der Pharmacie*, Dec. 1886, page, 1027.

Ointment of potassium iodide.—To mix solutions of iodide of potassium with petrolatum the *Süd Deutsche Apotheker Zeitung* recommends the addition of a small quantity of lanolin. The ointment is quickly made, is smooth, and does not separate even after standing a long time.

Urethane as an antidote to Strychnine, Picrotoxin and Resorcin.—Prof. Aurep experimented on animals with urethane and found it to be antagonistic to and a counter-poison for strychnine, picrotoxin and resorcin. Urethane is equally as good as chloral and is not dangerous, as large doses can be taken without affecting the circulation or respiration. To judge from the effect on dogs it would require from 8 to 12 grams of urethane to overcome strychnine poisoning in a human being.—*Ph. Post*, xix page 726.

New reaction for Hydrocyanic acid.—To the suspected liquid is added nitrite of potassium and ferric chloride acidulated with sulphuric acid and heated to near the boiling point. After the mixture has cooled the iron is precipitated by ammonia and filtered. The filtrate is tested for potassium nitro-prussiate with colorless solution of sulphide of ammonium. In a dilution of 1 part of hydrocyanic acid to 312,500 parts of water a distinct blueish-green coloration is produced. —*Ph. Post*, xix page 740.

Osmic acid.—Dr. Schapiro uses the following solution:

Osmic acid	0.455
Glycerin	14·20
Distilled water	24.60

This solution should be kept in a black bottle and if carefully sealed will keep for two or three weeks.

For neuralgic affections five drops of the above solution are injected hypodermically near the seat of pain. In some cases the injection must be renewed but does not produce any dangerous results.—*Journal de Pharm. et de Chim.* 1886, xiv, p. 519. (See also *Amer. Jour. Phar.*, 1884, page 648.)

YELLOW MERCURIC OXIDE.

By L. W. Hawkins.

My attention was lately directed to the difficulty in obtaining pure yellow mercuric oxide. When I say pure I mean perfectly pure. No doubt most samples obtained are all that could be desired pharmaceutically. But speaking chemically, I have not come across a sample that answered either of the tests required by the British Pharmacopœia. These tests are that it should entirely volatilize when heated to incipient redness, and that it should dissolve in hydrochloric acid, by which I understand to dissolve completely.

Of seven samples obtained from different sources, each left a residue when heated to low redness. Although these residues appeared considerable in the crucible, the percentage proved very small on weighing. As was expected they were chiefly composed of sodium chloride, the bye-product in the preparation, with a little sulphate. Three of them gave evidence of a trace of potassium, and No. 2 contained a little iron, while No. 7 contained magnesium as well.

Every sample failed to dissolve entirely in dilute hydrochloric acid, the insoluble portion being a white powder. This, on being separated was found to be calomel, indicating the presence of mercurous oxide in the original powder. With dilute nitric acid a better solution was effected, but in every case there was a small amount of insoluble matter, consisting of a layer of white powder which collected on the bottom of the test tube. This at first seemed strange, as every substance found in the ash would be readily soluble in nitric acid. It soon occurred to me however that the mercurous oxide present, together with the small quantity of sodium chloride, would, in the presence of acid form mercurous chloride, which is insoluble in cold nitric acid.

By the Pharmacopœia process for the preparation of yellow mercuric oxide, 40 fluidounces of liquor sodæ are ordered, while about 27 would do the work theoretically. This excess of sodium hydrate entirely prevents the occurrence of any other compound of mercury than oxide, and also gets rid of such impurities as lead and tin, should they be present, by precipitating them as hydrates and redissolving them.

The mercurous oxide was estimated by treating a weighed amount of the sample with dilute hydrochloric acid until all the yellow color

disappeared, and nothing remained undissolved but the small quantity of mercurous chloride. This was filtered off, washed with hot water, dried at 100° C., and weighed. From this weight was calculated the percentage of mercurous oxide. The mercuric oxide was estimated by passing sulphuretted hydrogen through the filtrates obtained in the previous estimation, after nearly neutralizing them with alkali. The resulting sulphide was then separated, dried and weighed, from which weight was obtained the equivalent weight of mercuric oxide.

The following are the results of 100 parts of each sample:—

	HgO.	Hg_2O.	Fixed matter.
1	98·238	·454	·272
2	96·489	·895	1·007
3	98·174	·532	·371
4	98·237	·746	·416
5	97·692	·268	·212
6	96·895	·853	·954
7	97·787	·758	1·015

The deficits, I presume, may be attributed to moisture which was not separately estimated, except in one or two cases, as a check.

It will be seen that all these samples are very satisfactory, especially when we consider the amount of time and trouble required to wash away the last traces of a bye-product from a large quantity of a preparation.

The mercurous oxide may be due to the mercuric chloride containing some soluble mercurous salt, which is scarcely probable, or else it may form in the mercuric oxide on keeping.* A freshly made sample, prepared by myself, gave a perfectly clear solution, with dilute hydrochloric acid.—*Phar. Jour. and Trans.*, Feb. 5, 1887, p. 640.

CRYSTALLINE ACID IN URINE POSSESSING MORE POWERFUL REDUCING PROPERTIES THAN GLUCOSE.

By John Marshall, M. D.,

Demonstrator of Chemistry, University of Pennsylvania.

In the early part of last November, Prof. Frank Donaldson, Sr., of Baltimore, sent for examination, to Prof. Tyson, of this city, a urine which contained a substance having strong reducing properties much resembling those possessed by glucose. After Prof. Tyson had finished his examination, he gave the remainder of the urine to Prof.

* On exposure to light, yellow mercuric oxide becomes dark in consequence of partial reduction to mercurous oxide. Editor A. J. P.

Wormley, for further investigation. From Prof. Wormley it came to me. From the results obtained by the three independent observers it was concluded that the reducing substance was certainly not glucose. This conclusion was at once communicated to Prof. Donaldson by Prof. Tyson, and at the same time Prof. Tyson requested that a larger quantity of urine be sent to me for further examination. This larger quantity was kindly sent by Prof. Donaldson, and arrived at the University on November 17th, and the examination was immediately continued. A few days afterward (November 21) crystals of the lead salt of the acid were obtained. Prof. Donaldson was at once informed of this result, and at the same time a few crystals of the salt were sent to him.

From Prof. Donaldson it was learned that the urine in question was voided by a man thirty-seven years of age, of florid complexion, and of average height and weight. His general health and nutrition have always been good. He has never had any muscular weakness or inordinate thirst, no emaciation, but instead a continued increase in weight, no excessive quantity of the secretions. He has always been temperate as to alcoholic stimulants. Since his seventeenth year he has been engaged in the lumber business, and at present is superintendent of a planing-mill which position requires his visiting the mill two or three times daily.

The case is peculiarly interesting, because of the man's having repeatedly, during the past two and a half years, applied to the various life insurance companies represented in Baltimore for insurance, but each time suffering rejection because of the response of his urine to certain reagents used in testing for glucose, a response which naturally was considered to be due to glucose.

Upon the ingestion of certain substances, other substances appear in the urine, which have a reducing action upon alkaline copper solutions. When camphor is ingested, camphoglycuronic acid, $C_{16}H_{24}O_8$, appears in the urine. This breaks up into glycuronic acid, $C_6H_{10}O_7$, which has a strong reducing action. Chloroform in the urine also reduces alkaline copper solution. Chloral is converted into urochloralic acid, $C_8H_{13}Cl_3O_7$. Turpentine into terpenoglycuronic acid. Morphia forms a reducing substance. Phenol (carbolic acid) and benzol form hydrochinon, $C_6H_4(OH)_2$. Phenol and benzol are also converted into oxyphenic acid (pyro-catechuic acid), $C_6H_4(OH)_2$, which latter probably is identical with the substance described by Boedeker as al-

kapton. Tannic acid is excreted as gallic acid. All these products possess the property of reducing alkaline copper solution. Hydrochinon and oxyphenic acid in the presence of an alkali, and when exposed to the air absorb oxygen, and turn first green, then brown, and, finally black.

It was learned that the person who voided the urine under examination never had occasion to use any of the above-named substances; and, therefore, one would hardly expect to find the products of their metamorphosis in the urine. It must not be forgotten, however, that oxyphenic acid has several times been found in normal urine.

The peculiar acid in question is contained in rather large quantity in this particular urine, nearly one gramme of the lead salt having been obtained from 100 cc. of the urine. Its reducing power is greater than that of glucose; 0·6 cc. of the undiluted urine was sufficient to reduce the cupric oxide in 10 cc. of Fehling's solution, equivalent to 0·05 of glucose, or, expressed in glucose units, equivalent to 8·3 per cent. of glucose.

Some of the reactions of this urine, when considerably diluted with water or with normal urine, strikingly resemble reactions often noticed in this laboratory in urine considered and acknowledged to be free from glucose, especially in the reaction with diluted Fehling's solution. With the urine containing the acid, diluted either with water or with normal urine, and diluted Fehling's solution, a brownish and sometimes greenish coloration is produced, but no appreciable reduction of the cupric oxide is observed. A similar result has often been noticed in this laboratory when a presumably normal urine has been tested with Fehling's solution.

It is quite likely that this acid may occur more frequently in urine than is suspected, probably only in less quantity than contained in the urine just referred to, and to its presence possibly may be attributed the many peculiar and unsatisfactory reactions so often noticed when testing urine with Fehling's solution. Quite likely, too, in some samples of urine, the acid may be contained in sufficient quantity to produce a reduction with Fehling's solution in such a satisfactory manner as to be mistaken for glucose, and thus many erroneous diagnoses of diabetes mellitus may have occurred.

The urine from which the acid was obtained was of a brownish red tint, perfectly clear and without sediment.

To isolate the acid the following method was employed:

The urine was treated with half its volume of plumbic tribasic acetate solution, and the resulting voluminous precipitate collected on a filter and washed several times with a mixture of equal parts of alcohol and water. The precipitate was then suspended in warm water and hydrogen sulphide passed through until all the lead was precipitated. After expelling the hydrogen sulphide from the filtrate by boiling, excess of plumbic carbonate was added, and the liquid was gently boiled several minutes, and then filtered while hot. The filtrate was concentrated on the water bath and then kept in a cool place to allow crystallization to occur. The crystals of the lead salt which separated were washed by decantation with a mixture of equal parts of alcohol and water and recrystallized from hot water. Finally, when sufficiently pure they were dissolved in hot water and the lead precipitated by hydrogen sulphide, filtered, and the filtrate containing the free acid evaporated to dryness at about 70° C. The residue was extracted with ethyl ether, and the latter evaporated spontaneously. Several recrystallizations from ether, the final one from a mixture of ether and water, are necessary to obtain the acid in a fairly pure condition. The crystal mass was pressed between bibulous paper and again recrystallized from water.

The acid thus obtained crystallizes in opaque white tetragonal prisms, melts at 140° C., and sublimes in the same prismatic form, the crystals generally radiating from a centre. It is very soluble in water and in ethyl ether, soluble in absolute alcohol and also in ordinary alcohol, sparingly soluble in chloroform, insoluble in benzol, toluol, and in petroleum ether.

When its solution in ethyl ether is evaporated at a temperature of about 60° C., a slight claret-red tint is produced, which soon resolves into spots of purple. This purple substance (somewhat resembling murexide) attaches itself to the crystalline mass, producing a very beautiful appearance. The crystals, including the purple substance, dissolve in water, with a disappearance of the purple coloration. In the spontaneous evaporation of the aqueous solution of the acid no change of color is noticed.

The acid does not contain sulphur or nitrogen.

The acid is absorbed by animal charcoal. When the urine itself is passed through animal charcoal the filtrate becomes dark claret-red in color, and has lost its reducing property.

Sodium hydrate gives a brownish coloration, beginning at the sur-

face of the liquid (due to absorption of oxygen). Oxyphenic acid gives an almost similar reaction, only that a green coloration is first produced, which is not the case with the other acid. The brownish coloration noticed when the diluted urine containing the acid is added to Fehling's solution, is partly due to the action of the alkali of the Fehling's solution upon the acid.

Picric acid causes no change. Upon the addition of sodium hydrate to the mixture of the acid and picric acid, a brownish coloration is produced, similar to that produced by sodium hydrate alone.

No reduction of the bismuth salt in Böttger's test occurs with the acid.

The acid responds to Trommer's test, as also to Fehling's test.

Argentic nitrate is reduced in the cold by the acid.

The fermentation test fails completely.

Its aqueous solution has no effect upon polarized light.

Upon the addition in turn of a dilute neutral solution of ferric chloride, ammonium hydrate, and acetic acid, the play of colors from green to violet, and then to green as with oxyphenic acid, does not occur. It does not respond to the tests for hydrochinon.

With a dilute neutral solution of ferric chloride a blue coloration is produced which very soon disappears. From this reaction the acid is most likely a phenol derivative. It forms lead, barium, and calcium salts.

The lead salt crystallizes in heavy needle-like prisms, melting at 209·5° C. It is soluble in hot water, insoluble in benzol, toluol, petroleum ether, absolute or ordinary alcohol, ethyl ether, and chloroform. It is decomposed when passed through animal charcoal, the acid remaining in the charcoal and the lead coming through with the filtrate as oxide.

On account of insufficiency of pure material—acid and lead salt—no ultimate analysis has thus far been made. In a short time I hope to have enough material for that purpose, and then a formula for the acid can be constructed, and more learned regarding its source in the human organism. However, two lead determinations in the lead salt have been made:

0·1466 gramme lead salt gave 0.0717 gramme $PbSO_4$, equivalent to 33.50 per cent. of lead.

0·1314 gramme lead salt gave 0·0649 gramme $PbSO_4$, equivalent to 33·66 per cent. of lead.

Mean percentage of the two determinations, 33·58 per cent. lead, indicating that the acid has a high molecular weight.

I would suggest for this substance, provisionally, the name glycosuric acid.

Medical Chemical Laboratory, University of Pennsylvania.

—*Med. News*, Jan. 8, 1887, p. 35.

KERNER'S QUININE TEST,

With special reference to the form in which it is applied in the French Codex.

By E. Jungfleisch.

The recent discussions on the purity of quinine sulphate of commerce have induced me to lay before the Pharmaceutical Society of Paris sundry observations that I have already mentioned in a cursory manner in a report read to the Academy of Medicine. The point to which I shall refer especially is the test prescribed by the official pharmacopœia as a slightly modified application of the principle involved in Kerner's test. As it stands in the Codex of 1884 it certainly leaves much to be desired, but it does not merit all the censure that has been bestowed upon it. Though a delicate test, and in some respects even too delicate, it is nevertheless susceptible of being made use of by every pharmacist. It has, moreover, a characteristic which I would like to believe is ephemeral, but which may for the time be allowed to cover all its defects: among the tests which admit of the detection of the alkaloids most usually mixed with quinine sulphate it is still the least imperfect, the most simple, and the most expeditious.

Of all the criticisms which have been passed on this test the most telling is that relating to the preparation of the saturated solution of quinine sulphate at 15°C., charged also with the more soluble salts of alkaloids other than quinine.

The Codex directs that the quinine sulphate to be assayed shall be heated with water, but it does not specify the temperature. This criticism is well founded; it points out an omission that needs to be made good, and for that reason the Pharmaceutical Society of Paris has under consideration the provisional fixing, by a kind of convention, of a temperature at which the solution should be made. It may be useful to remark, however, that the decision to take this step would depend chiefly upon the demands to be made as to the purity of the official salt, but that, on the other hand, the fixing of that temperature would not give the process all the precision which some persons appear to hope. This is a point that deserves to be investigated.

In general I have operated at a temperature of 60° C., which corresponds sufficiently well to the too vague expression in the Codex; but in principle I see no inconvenience in adopting any higher temperature, even that of boiling water, which has the advantage of being easily applied and kept constant. I even propose to show that the boiling temperature should be adopted, and also that the other conditions of the test should be rendered more stringent if it be desired to require the complete purity of the official quinine sulphate, while, on the contrary, if it be admissible to tolerate in that salt a small proportion of foreign alkaloids, the tolerance will be so much the less in proportion as the temperature is higher. The misconception of these conditions lies at the root of most of the discussions raised on the subject, and of the objections urged against the method of assaying in question.

If evidence of the purity of the salt is to be obtained, it is clear that in order to test it the whole of the foreign salts that are to be detected must be made to pass into solution. It is therefore necessary to dissolve as much as possible of the crystals, or, in other words, to raise the temperature as much as possible. It has been contended that if the solution is made with heat above the temperature of 35° C., even pure quinine sulphate will not answer the requirements of the Codex test, the reason being that the hot solution remains supersaturated after being cooled to 15° C. But it is easy to prove that the experiments upon which that statement has been based were made with very impure quinine sulphate. Moreover, the suggested explanation is no more admissible than the statement of the alleged fact, for a saline solution cooled, as in this case, in contact with a large quantity of crystals of the salt in solution, would not remain supersaturated.

When, in short, the Codex text is applied to really pure quinine sulphate by heating on a water-bath to 100° C. in making the solution, the liquid obtained will remain limpid after the addition of ammonia just as well as when the temperature has been raised only to a much lower degree. But that is not all, and when in that case, operating either with or without heat, the ammonia (0·96 specific gravity) is gradually added to the 5 cc. of the properly cooled solution, it will be found that in order to dissolve the precipitate at first formed it is not requisite to use the 7 cc. of the reagent ordered by the Codex, but that a much less quantity, about 5·5 cc., will be found sufficient for restoring the clearness of the liquid.

This very simple experiment furnishes a conclusive answer to the objection above mentioned, and it justifies my second proposition, that if the official salt is required to be completely pure the Codex test must be modified, not only by carrying the temperature to 100° C., but also by limiting to nearly about 5·5 cc. the volume of ammonia solution of 0·96 that is to be added for the purpose of rendering the liquid clear after precipitation.

It is sufficient to read the article in which the Codex treats of quinine sulphate to recognize that its editors have taken a different point of view. They have only demanded for this salt a relative purity. This is evident from the indications given for ascertaining "the presence of an inadmissible proportion of alkaloids other than quinine." But if the authors of the official pharmacopœia hesitated to insist upon the complete purification of an industrial product, in regard to which certain consumers had themselves acquired usages difficult to abandon suddenly, they nevertheless very clearly showed, by the nature and the number of the tests prescribed, their intention to induce French pharmacists to exercise increased vigilance in this particular. But however that may be, a test admitting of a certain degree of tolerance is the point of more special interest at the present moment.

The quinine sulphate of commerce retains foreign bases in two ways. First, the surfaces of the crystals are moistened with a certain quantity of mother-liquor which imperfect draining has not removed, and that has afterwards dried upon them. Second, the crystals formed in a liquor, charged with cinchonidine sulphate, for example, have entangled some of the latter salt, and sometimes a considerable porportion of it.* In treating quinine sulphate to be tested as Mr. Kerner directs in one of the forms of his test, with cold water, the water readily becomes charged with the soluble salts left by the mother-liquor on the surfaces of the crystals, but it does not come sufficiently into contact with the cinchonidine sulphate entangled among those crystals, and that is consequently protected from the action of the solvent by the sparingly soluble quinine sulphate amongst which it is in-

* The tendency of quinine sulphate and cinchonidine sulphate to crystallize together is very marked. When quinine sulphate mixed with a few hundredths of cinchonidine sulphate is dissolved in boiling water, and even when the volume of the solvent is many times more than would be sufficient in the cold to dissolve the whole of the cinchonidine salt if it were in a separate state, the latter salt will partially crystallize with the quinine sulphate during the cooling of the solution.

timately mixed up. When the mixture is heated gradually the proportion of quinine sulphate dissolved goes on increasing, and a larger quantity of the cinchonidine sulphate passes into solution in such a manner that, from the circumstance of the two salts being mixed in the crystals, the quantities dissolved of each are correlative. The volume of water used being insufficient for dissolving even at 100° C. the whole of the quinine sulphate, a very notable part of the impurities will also remain undissolved, and not come within the scope of the subsequent operations. By cooling the solution to 15° C. almost the whole of the quinine sulphate crystallizes out, taking with it some of the cinchonidine salt; but the greater part of this latter salt remains in solution. The quantity of cinchonidine salt transferred to the solution is thus increased in proportion as the heating is augmented. It can easily be ascertained that this is what happens, by making several tests with the same sample of impure quinine sulphate, and applying different temperatures for the solution. It will thus be found that the volume of ammonia necessary for redissolving the bases liberated will be increased in proportion as the temperature applied is higher. This may also be ascertained by comparing the weights of the dry residues left on evaporating equal volumes of the solutions obtained when different degrees of heat are applied in the testing operation. M. Marty has in this way shown that the quantity of the residue is greater in proportion as the heating is greater.

In short, the delicacy of the test is so much greater as the solution is made at a higher temperature, and the selection of a particular temperature should be regulated according to the greater or less demand for proof of purity in the official quinine sulphate.

It has also been said that this mode of testing, when carried out with heat, involves the demand for an exaggerated degree of purity incompatible with the industrial production of quinine sulphate. One of the experiments cited above is sufficient to prove the contrary. It will be remembered in fact that pure quinine sulphate, treated with warm or even boiling water, gives a solution, 5 cc. of which, when cooled to 15° C. became quite clear on addition of about 5·5 cc. of ammonia solution (0·96). But the Codex does not require this result to be produced by less than 7 cc. of ammonia solution; the difference of 1·5 cc., or more than one-fifth of the whole quantity, being available for the solution of bases other than quinine in the event of their being present. This difference represents therefore the tolerance of the prescribed test.

If it be attempted to appraise that tolerance by expressing the quantity of foreign bases that may be present in quinine sulphate which is shown by the test to be acceptable, the result will be a failure. Hitherto I have supposed, for greater simplicity of exposition, that the impurity is exclusively cinchonidine sulphate. This is at the present time most frequently the case, but, sometimes, other bases also occur in the commercial product, though less frequently. Those bases, being unequally soluble in ammonia, the delicacy of the test in reference to each of them will be inversely as their solubility, and the tolerance will be variable.

Nor is this all, for in considering only the admixture of cinchonidine, and admitting a fixed temperature, say 60° C. for instance, as being adopted in practice, that is to say, by reducing the problem to the most simple form, it is still impossible to arrive at a perfectly satisfactory conclusion. When 1 gram of quinine sulphate is treated with 10 cc. of water, the solution is only partial even at 100° C., and the interior parts of the crystals escape the action of the solvent entirely.

Under these conditions it will happen that for a given amount of cinchonidine in a sample of salt tested, if the impurity arises solely from imperfect drainage off of the mother-liquors and is superficial, the proportion of cinchonidine that will pass into the solution will be greater than if the impurity be due to cinchonidine actually in the crystals. Consequently the delicacy of the test would be greater in the former case than in the latter and the tolerance would be less in that case. Moreover, when it is noted that the crystals vary in size and present a varying surface, that they are not generally homogeneous, that the distribution of the cinchonidine through the interior of them necessarily alters according to the circumstances of the crystallization, etc., it is impossible to avoid recognizing that the tolerance to be appraised will have a considerable range of variation. Therefore, I cannot express by figures having any precision the increase of the tolerance corresponding with the application of the test at temperatures between 15° and 100° C. With cinchonidine sulphate as the sole impurity, and taking 60° C. as the temperature for making the solution, the quantity of foreign substance passing unnoti ed appears to vary between 4 and 5 per cent. The magnitude of this amount may perhaps be an argument in favor of raising the temperature to be adopted; but this is a point which I merely mention here as deserv-

ing consideration. When the test is applied without heating, as the German Pharmacopœia directs, the tolerance may amount to 12 per cent., or even more than that.

The foregoing remarks must be understood as applying to the quinine sulphate of commerce. The figures obtained by various authorities with mixtures prepared for the purpose are not applicable to the mixed crystallization of the commercial salt.

There are certain other objections of secondary importance which appear to me as being well founded in reference to the method of testing used in question.

I have already pointed out that considerable precision is required in carrying out the details of the operation, and especially in the measurement of the volumes of the liquids used.

I may also add that the temperature of 15° C., at which the solution has to be kept for some time, is not always readily obtainable, especially in summer, without having recourse to some means of artificial refrigeration.

Another small difficulty arises from the physical condition of quinine sulphate, owing to which it mechanically retains the aqueous liquid with which it is mixed, and does not always allow the separation by means of a paper filter of the volume necessary for the treatment with ammonia. The result required may, however, be easily obtained by making use of a filtering apparatus formed of a funnel fitted with a plug of cotton wool, and fitted by a perforated cork into the neck of a tubular flask, so that the solution may be sucked out from the crystals.

Another point of more importance is the strength of the ammoniacal solution being precisely regulated to the requirements of the test. If, for instance, it were used of a specific gravity of 0·925, considerable errors would result, and the quinine sulphate represented as being acceptable for use under such conditions would in reality be very impure. It is therefore impossible to lay too much stress upon the importance of accuracy in the preparation of the ammonia solution.

The Codex has stated in a note the error that may be caused by the application of the test to an effloresced salt. A pure salt, whether effloresced or not, will never be mistaken for an impure one when the the test is applied to it in accordance with the directions of the Pharmacopœia ; it may even be remarked that if complete purity had been required in the official salt, the weighing of the quantity taken for

testing would have been superfluous, for the solution after recrystallization at 15° C. ought always to give a clear liquid on the addition of ammonia, however much of the salt was operated upon. But since a certain tolerance is allowed for the manufacture the case is altered in this respect. If the sulphate has lost by effloresence some part of the water which it should contain in the normal condition, one gram of it will represent a proportionally larger quantity of the fully hydrated salt; the impurity passing into solution would thus be increased in quantity and the tolerance diminished. In such a case the best plan is to dry the salt completely at 100° C., and to take a quantity weighing ·8555 gram instead of one gram, as the Codex recognizes that the salt should contain 14·45 per cent. water of crystallization. At the same time it should not be forgotten that in effloresceing, the crystals undergo a disintegration which renders the material especially fit to be acted upon by water as a solvent, and this will tend to diminish the tolerance.

Recently Kremel has pointed out a possible modification of Kerner's test, based upon the circumstance that the solutions of the sulphates of cinchona alkaloids saturated at a temperature of 15° C. contain different quantities of these salts as follows :—

5 cc. of solution.	Contain
Quinine Sulphate.....	0·0062 gram of the salt.
Quinidine "	·0464 " "
Cinchonidine "	·0510 " "
Cinchonine "	·0925 " "

Consequently, the same measure of the solutions also contain very different quantities of sulphuric acid, and as the alkaloids in question do not react upon phenophtalein it is possible to titrate the sulphuric acid in a solution of quinine sulphate, with an alkaline solution as well as if it was in a free state. The quantity of sulphuric acid found in a solution of pure quinine sulphate would be very much less than in a solution of an impure sample, and in this way the amount of impurity might be ascertained.

The sources of errors already referred to as being inseparable from the preparation of the solution saturated at 15° C. from the commercial quinine sulphate would obviously exercise the same kind of influence upon results obtained by the method proposed by Kremel as upon those obtained by the method of the Codex. A further error would also be made by taking the quantity of sulphuric acid as being

in constant proportion to that of the anhydrous sulphates, even when the bases of those salts were not isomeric, the molecular weight of cinchonidine sulphate being 718 and that of quinidine sulphate 746. Another error would result from the identification, from the point of view of foreign material, of cinchonine sulphate with two molecules of water of crystallization (molecular weight 754), with cinchonidine sulphate containing six molecules of water (molecular weight 794).

Some time ago Dr. Hesse pointed out a method of testing, which differed in principle from that of Kerner as applied in the cold only, in using another solvent for the alkaloids, ether being substituted for ammonia for this purpose. This mode of testing has been slightly modified by Schaefer and recommended by him in the following form:— A gram of the quinine sulphate to be tested is heated with 20 cc. of distilled water to the boiling point, and, after being allowed to cool, 5 cc. of the clear filtered liquid is placed in a well-corked tube with 1 cc. of ether and five drops of ammonia and then well shaken. If after the lapse of twenty-four hours there is no separation of crystals from the ether solution of the alkaloid, the quinine sulphate is considered to be acceptable for use as pure. But even with this modification, the test in question, although possessing some delicacy for detecting cinchonidine, has not this advantage in regard to quinidine, which is somewhat freely soluble in ether. It must not, therefore, be forgotten that although cinchonidine is at the present time the most ordinary impurity of quinine sulphate, the salt prepared from cuprea bark does not contain any cinchonidine, but a very considerable proportion of quinidine.

The testing of quinine sulphate by means of the polarimeter having many partisans, I venture to state here the reasons for which I consider that this method of testing is a bad one. I shall show that it is very much wanting in delicacy, and besides this, that it may give rise to very considerable errors.

There is no doubt that quinine sulphate possesses a specific rotatory power peculiar to it, which is susceptible of being applied for ascertaining the purity of the salt. This rotatory power being the highest among those of the lævogyrate sulphates of the cinchona alkaloids, being, in fact, a maximum quantity, its application for the purpose presents an especial advantage. If, therefore, the quinine sulphate employed in pharmacy were to be perfectly pure, that method of testing, with more or less delicacy, would be applicable for the purpose in view.

But when it is requisite to allow manufacturers a certain tolerance, and in consequence of this to ascertain whether the salt to be tested is contaminated with foreign substances in proportion above or below a fixed limit, the case is no longer one of the same nature. Some very simple calculations will suffice to show this, and I shall for this purpose make use only of the figures furnished by M. Oudemans, and take for illustration the experiments made under the conditions of dilution for which those figures have been found.

In calculating for a length of column of 2 decimetres the deviation produced by 0·436 gram of the alkaloid sulphate dissolved in 20 cc. of absolute alcohol the following results are obtained. The deviation is $\alpha_D = -6{\cdot}86°$* for the neutral crystallized quinine sulphate, and for the neutral crystallized cinchonidine sulphate it is $\alpha_D = -5{\cdot}17°$.†

Therefore the diviation produced by any mixture of these two sulphates will lie between these two extreme limits. One hundredth part of the difference between the two figures (1.69°) would be 0·0169, and that would be the influence exercised by the presence of 1 per cent. of cinchonidine sulphate, more or less in quinine sulphate. I believe that this relation between 17 thousandths of a degree and each hundredth part of cinchonidine sulphate more or less in the mixture will render sufficiently appreciable the delicacy of this method of testing. But the method has still another defect of very much greater significance.

If pure quinine sulphate be mixed with one hundredth part of quinidine sulphate, a highly dextrogyrate salt, the deviation calculated for the same conditions would be for $\alpha_D = -6{\cdot}701°$,‡ and that is precisely

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* $$\alpha_D = \frac{\alpha_D lp}{v} = \frac{157{\cdot}4 \times 2 \times 0{\cdot}436}{20} = -6{\cdot}86°.$$

† $$\alpha_D = \frac{\alpha_D lp}{v} = \frac{118{\cdot}7 \times 2 \times 0{\cdot}436}{20} = -5{\cdot}17°.$$

‡ $$\alpha_D = \frac{\alpha_D l}{v} = \frac{0{\cdot}99 \times 0{\cdot}436}{v} + \frac{\alpha_D l\, 0{\cdot}01 \times 0{\cdot}436}{v}$$

$$\alpha_D = -\frac{0{\cdot}4316 \times 2 \times 1{\cdot}574}{20} + \frac{0{\cdot}0044 \times 2 \times 211\,5}{20}$$

$$\alpha_D = -6{\cdot}793 \times 0{\cdot}09 = -6{\cdot}701°.$$

the result which would be obtained with a mixture of 90·83 quinine sulphate with 9·17 of cinchonidine sulphate.* In this manner, quinine sulphate containing an admixture of 10·5 per cent. quinidine sulphate would produce a deviation of 5·17, that is to say a deviation precisely equal to that produced by pure cinchonidine sulphate.†

I have here supposed that an alcoholic solution is operated upon, because the memoir of M. Oudemans furnishes directly the data necessary for the calculation of this particular case; but in principle there is no difference when the salt is dissolved in water by the aid of sulphuric acid. The delicacy is, however, a little greater, and the error a little less in the latter case, the relations between the specific rotatory powers of the three acid salts being a little less unfavorable than those obtaining between the neutral salts. Now, for example, when a deviation of −12·13 is observed for pure quinine sulphate, the presence of two per cent. quinidine sulphate in the quinine salt would suffice to reduce the deviation to −11·60, while to produce the same result it would be necessary that the quantity of cinchonidine sulphate mixed with the quinine salt should amount to 11·8 per cent.

Thus then with the alcoholic solution quinine sulphate containing only ten hundredths of impurity might be mistaken for pure cinchonidine sulphate, and with the acidulated aqueous solution the possible error would vary from one to six times as much. This consideration of the case will make it unnecessary to refer to other sources of error.

Before concluding I will add another remark.

It is by design that I have made use of the term tolerance in treating of this subject. If it could be maintained that the presence of a few hundredths of the alkaloids allied to quinine would be incapable of causing any real prejudice to patients, if certain manufacturers pretend that the elimination of these last traces of impurity presents difficulties for them, if various reasons induce us to allow for the present a certain latitude to the manufacturer, it is nevertheless incontestable that there is here only a question of tolerance to be dealt with; the pure quinine sulphate is the official article, the normal article, the imperfectly purified salt being nothing more than a make-shift.‡ The conversion of

* $6{\cdot}701=\frac{(6{\cdot}436-x)2\times157{\cdot}4}{20}+\frac{x\times2\times118{\cdot}7}{20}$ whence the weight of cinchonidine salt $x=0{\cdot}04$ or 9·17 per cent. of the mixture.

† $(100-x)157{\cdot}4+211{\cdot}5x=118{\cdot}57\times100$; whence $x=10{\cdot}5$.

‡ "The official quinine sulphate should not contain any of the other cinchona alkaloids."—Codex, 1884, p. 299.

the impure salt into a pure salt represents nothing more than a small difference in the intrinsic value; the pharmacist really solicitous for the quality of the products he supplies will therefore act wisely in repudiating any kind of tolerance, and demanding from the manufacturer to be supplied with an absolutely pure salt. This is easily to be characterized according to what has already been stated above;§ its special crystallization in a dense form is moreover a primary feature which has maintained up to the present its value, and to which pharmacists should adhere.

I am well aware that it is usual to attach to the light sulphate particular qualities, the value of which I do not remember. Certain makers have even found themselves constrained lately to give the pure salt this light form, and they have succeeded in doing so. The commercial interest attaching to their success in this respect ought to be a real one, since they congratulate themselves upon it; but I do not perceive any advantage that pharmacists would derive from the circumstance that an article which they sell in a state of purity should receive the appearance of the same article in an impure condition.—*Phar. Jour. and Trans.*, Jan. 22, 1887; *Jour. Phar. Chim.*, Jan. 1887. p. 5.

ON POIVRETTE

By Prof. J. Campbell Brown, D. Sc.

Read at the Meeting of Public Analysts, January 12th, 1887.

The substance known in the pepper trade as "Poivrette," or "Pepperette," is now so frequently used for the purpose of "fraudulently increasing the weight and bulk" of commercial pepper, that the members of this Society ought never to omit a careful search for it in all samples of pepper officially submitted to them. As many commercial analysts do not appear to be yet familiar with poivrette, and as some public analysts have applied to me for specimens, a short account of it may be of use to the Society. It made its first appearance in Liverpool last summer, when more than one wholesale pepper merchant brought me samples, and inquired what the substance was, and what were its properties. During the last three months I have met with it in between twenty and thirty retail samples of pepper.

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§ Kerner's test modified applied at 100° C.; 5 cc. of the solution at 15° C. being rendered clear by less than 6 cc. of ammonia (0·96 specific gravity), the other characters named in the Codex; maximum rotatory power to the left, etc.

Poivrette is a pale, slightly buff, or cream-colored powder, resembling in the bulk the principal middle layers of the pepper-berry, when ground; and when mixed with pepper cannot be distinguished by the eye, nor even by the hand-lens, from particles of pepper. In the earlier samples the coarser particles could be isolated by spreading the pepper on a stiff sheet of paper held in a nearly, but not quite horizontal position; on tapping this with the finger tips, so as to make the larger particles jump gradually to the lower edge of the sheet, the poivrette particles could then be picked out, and easily distinguished from pepper by crushing them between the teeth. Recently, however, it has been so finely ground and sifted that it cannot always be partly separated in this way, although the toughness and hardness of the particles can always be distinguished by the teeth in a mixture.

Microscopic examination, with a $\frac{1}{6}$th or $\frac{1}{8}$th objective, shows that it consists of pale, dense ligneous cells, some entire and marked with linear air spaces, some torn and indistinct.

The following letters (which afterwards appeared in some local newspapers) indicate the country from which it comes:—

The following letter from Leghorn has been received by a local spice house, and similar letters have been circulated throughout the country:—

"LIVORNO, August 1, 1886.

Dear Sirs,—I send you by this post two samples of an article called 'pepperette' (white and black), which is made of the pulp of a fruit growing in this country, which has the power of retaining the piquancy of pepper when it has been mixed with the same in the proper proportion. This is warranted to consist of this purely vegetable substance, and to contain nothing deleterious, consequently to be in no way detrimental to the health. The price is £8 per ton of 1000 kilogrammes, goods delivered c.i.f. in Liverpool, packed in 2 cwt. bags; bags free, no tare, shipping weight; $2\frac{1}{2}$ per cent. discount for cash. I export my pepperette very largely all over the Continent and to Great Britain, where, on account of its cheapness, it is used very much for blending pepper, which is sold as "prepared pepper," or "pepper not warranted genuine," in the same way as is done with mustard, or with ground coffee and chicory (the so-called French coffee). If so desired, the white pepperette can be had much lighter. If you desire any references I shall be happy to furnish you any amount in England, as well as on the Continent. Yours Truly

_____ _____."

A reply was forwarded, in due course, to the manufacturers of "pepperette," asking for further particulars and references, and the following letter was received:—

"Dear Sirs,—I am favored with your letter, 16th instant, and note contents, 'Pepperette.' What you ask me is a question that is very frequently asked me by English houses, but I am always in the impossibility to reply to it; in fact, I *must not* do it. When I sell my 'pepperette' (or 'poivrette') to a firm, I bind myself not to mention their name to anybody, and will do so with your good selves, if I have the pleasure of being favored with your orders. I make it a point of the question of secrecy with all my customers for this article, and cannot make an exception with you. Give me a sample order of a few tons, and I shall execute it to your entire satisfaction; payment after receipt and approval of the goods. However, for your guidance, and according to what I promised with my letter of the 13th inst., I now beg to subjoin a few English references, who can inform you concerning my respectability, but kindly do not mention to them anything about 'poivrette,' the same being houses from whom I import English goods (*i. e.*, my firm, —— ——). As already written, I shall be able to send sample of white poivrette of lighter color by October next. In the meantime I trust to be favored with your esteemed orders, and remain, dear sirs,

—— ——."

I therefore examined, amongst other substances, walnut-shells, almond-shells and olive-stones. The cells of walnut-shells are dotted, though otherwise similar to poivrette; the almond-shells greatly resemble poivrette, and olive-stones still more closely resemble it. Chemical analysis indicates the closest correspondence between poivrette and olive-stones, as the following figures show:—

	Ash.	Matters soluble by boiling in dil. acid.	Albuminous and other matters soluble in alkali.	Woody fiber, insoluble in acid and alkali.	Starch.
White pepperette	1·33	38·32	14·08	48·48	None.
Black pepperette	2·47	34·55	17·66	47·69	"
Ground almond-shells	2·05	23·53	24·79	51·68	"
Ground olive-stones	1·61	39·08	15·04	45·38	"

The stones of olives, imported in pickle for table use, gave 3·68 per cent. of ash, but well washed olive-stones, thoroughly burnt to a white ash, gave under two per cent. of ash like poivrette. "White poivrette" is therefore cleaned very pale, and perhaps partly bleached

olive-stones, or precisely similar tissue; black poivrette is the same, mixed with a little black husk. It is to be noted that, although it contains no starch, yet it yields some sugar to Fehling's solution, after being boiled for some time with dilute hydrochloric acid. The quantity depends on the length of time and strength of acid, but may be stated approximately about ten per cent. It is important to bear this fact in mind when making a full chemical analysis of pepper containing poivrette. After removing from such a mixture the matters soluble by boiling in dilute caustic alkali, the woody fiber which remains had a yellow color; it consists of the poivrette, and some of the cells of pepper-husk and one of the subcortical layers of the pepper-berry. The pepper-cells are made lighter, and the poivrette cells darker by the alkali, so that the two are more nearly of a similar yellow color after treatment with alkali. This renders it more difficult to distinguish such of the cells as have somewhat similar markings; but it enables us to distinguish more clearly, as poivrette, the many torn particles which have no definite form or markings. The final examination of the complete cells is better made with good daylight rather than with artificial light, and in a portion which has been treated with water only.

The pepper cells are mostly different in shape, and are colored, and have generally a dark substance in the interior. They are not numerous, but the quantity varies in commercial samples, owing to the modern practice of decorticating the pepper-berry to every different extent possible, and mixing the various portions so obtained, including husks, in every variety of proportion with each other or with ordinary pepper. Each individual analyst must make himself familiar with both kinds of cells, as no description can convey an adequate idea of either. In order to form a judgment regarding the proportions of the different chemical constituents of commercial samples, we require to know the chemical composition of the different layers of the pepper-corn; and I hope soon to communicate to the Society some figures bearing on this point, as well as to notice some other substances used in the sophistication of pepper.

It is interesting to note that the exemption, mentioned in section 8 of the Sale of Food and Drugs Act, in the case of a label being affixed to the article sold, intimating that the same is a mixture, does not apply in the case of poivrette, the admixture being made manifestly for the purpose of fraudulently increasing the weight and bulk.

Liverpool, 4th January, 1887.—*The Analyst*, Feb., 1887, p. 23.

FERMENTS IN MILK JUICES.

By A. Hansen.

The author has examined the latex of different species of plants for the presence of ferments. He finds none in the Euphorbiaceæ, in *Ficus elastica*, *Scorzonera*, *Taraxacum*, or the juice of the opium poppy. The latex of *Ficus Caricà* on the other hand, contains principles capable of effecting four fermentative changes; they peptonize albuminoïds in the presence of either alkalis or acids, act like diastase on starch, and coagulate the caseïn of milk. 20—100 grams of fibrin previously caused to swell by immersion in hydrochloric acid of 0·2 per cent. strength, are completely dissolved in 10—30 minutes when treated at 40° with 2—3 cc. of this latex. The products of this digestion are the same as with pepsin, yet the two ferments are not identical, since the ficus latex peptonizes in presence of alkalis as well as acids, although more slowly. Probably there are two peptic ferments present, one acting in acid, the other in alkaline solutions.

By digestion with hydrochloric acid, the latex entirely loses its peptonizing properties; digested with sodium carbonate (which destroys the activity of pepsin) it retains them intact. If a few drops of the latex be added to milk, which is then raised to the boiling temperature, the caseïn is at once precipitated. Incipient ebullition therefore, does not destroy the curdling power of this latex, although prolonged ebullition does, and even a temperature of 65° if continued for two hours. The diastatic action of this latex is demonstrated by the partial transformation of starch-paste and glycogen into sugar. When the latex is precipitated by alcohol and the precipitate taken up with water, the action on milk and on starch is found to persist, whilst that on fibrin disappears.

The latex of *Carica Papaya* peptonizes, precipitates caseïn, and transforms starch into sugar.

The author does not consider that these vegetable ferments play any *rôle* in the nutrition of the plant.—*Jour. Chem. Soc*, 1886, p. 1059; *Botan. Ztg.*, 1886, p. 137.

CONVERSION OF GLUCOSES INTO DEXTRINS.

By E. Grimaux and L. Lefevre.

Pure glucose was dissolved in eight times its weight of hydrochloric acid of sp. gr. 1·026, the solution distilled in a vacuum on the water-bath, and the syrupy amber-colored residue dissolved in water and

precipitated by alcohol, solution and precipitation being repeated several times. The product was then dissolved in water, decolorized by animal charcoal, the solution concentrated by evaporation in a vacuum on the water-bath, and then allowed to evaporate in a vacuum at the ordinary temperature. The product thus obtained is a white powder which resembles ordinary white dextrin, is very hygroscopic, and forms gummy solutions. Its reducing and rotatory powers vary with the number of times the substance has been redissolved and reprecipitated. When prepared by the method just described, the dextrin contains a small proportion of fermentable sugar, which can be removed by treatment with yeast. After purification in this way, one product had a reducing power of 17·8 per cent., whilst its rotatory power for $[a]_D = + 97{\cdot}48$.

The dextrin obtained in this way has the composition $3C_6H_{10}O_5 + H_2O$, and belongs to the class of achroodextrins. Its general properties resemble those of the dextrin obtained by Musculus by the action of sulphuric acid on glucose in presence of alcohol, but it has a lower rotatory and reducing power. It is not colored by iodine, is unaffected by infusion of malt, and undergoes hydration somewhat slowly when boiled with dilute acids. The glucose formed from it by the action of acids is readily fermentable.

The alcoholic liquid from which the dextrin has been precipitated contains other dextrins with higher reducing powers, together with a fermentable sugar which is found by Fischer's reaction with phenylhydrazine and sodium acetate to be a mixture of glucose and maltose.

Galactose from milk-sugar behaves like dextrose, and yields a galactodextrin which resembles glucodextrin. Its reducing power in terms of glucose is 10 per cent., and its rotatory power for $[a]_D = + 80$.—*Jour. Chem. Soc.*, 1886, p. 1003, *Compt. rend.* ciii, 746.

GLEANINGS IN MATERIA MEDICA.

By the Editor.

Cantharides as a preventive of hydrophobia.—According to *Brit. Med. Jour.*, a Russian physician, Dr. Karchewski, has treated three persons, who had been bitten by a rabid wolf, with cantharides plaster applied to the wounds, giving at the same time one grain of powdered cantharides daily for one week. After seven months no symptoms of rabies had appeared.

This method of treatment was recommended as being always successful by Dr. J. N. Rust, of Berlin, in the early part of this century; for internal use he ordered:

Cantharid.....gr. xij.
Lapid. cancror.....
Sacchari.....āā 3jss.
M. ft. pulv. xij

One powder to be taken twice or thrice daily.

In this connection it may be mentioned that according to *Les Nouveaux Remèdes*, 1886, p. 525, Dr. Keegan has treated in India, with apparent success, several cases of hydrophobia by the local application of a four per cent. solution of *cocaine* to the back part of the throat; and that Dr. Fernandez, of Barcelona (Ibid., p. 521), is experimenting upon dogs by inoculating them with *viper poison* as a preventive of rabies.

Aesculus Hippocastanum, Lin.—In medical works, including those on medical botany, in which the horse chestnut tree is mentioned, the discussion of the medical properties is usually confined to the use of the bark as an antiperiodic, and of the fixed oil as a topical remedy in rheumatic complaints. Occasionally the sternutatory properties of the powdered seeds are mentioned, and in works from the beginning of the present century we find it stated that a paste made from the seeds is useful in chilblains, and a decoction of the roasted seeds has been recommended in atonic uterine hemorrhages. A still older work (Murray appar. IV. p. 62), which is stated to give the uses of the horse chestnut in former times, could not be consulted by us. In only one of the modern works consulted (National Dispensatory, 3rd and 4th edit., p. 765) has been observed a reference to the popular use of the leaves in whooping cough, and of the seeds in hæmorrhoids.

That this popular use has not been forgotten, we learned from Mr. Geo. W. Stoeckel, of Reading, Pa., at the meeting of the Pennsylvania Pharmaceutical Association in 1886. More recently Mr. Stoeckel has informed us that the use of the leaves and seeds in the manner indicated below is not uncommon in the southeastern counties of Pennsylvania. A decoction of the leaves is regarded as a remedy in whooping cough and is given in small doses frequently repeated, while the bruised fresh leaves, sometimes mixed with lard, are at the same time employed externally. The entire seed is carried in the pocket

as a kind of charm against piles, and the powdered white kernel is thoroughly triturated with lard into an ointment, which is said to be successfully applied against piles.

Poisoning by the bark of Robinia Pseudacacia, L.—Dr. Z. T. Emery reports (*N. Y. Med. Jour.*, Jan. 22, 1887) on the poisoning of thirty-two boys at the Brooklyn Orphan Asylum from chewing the inner bark of the locust-tree, which they had obtained from the yard where fence-posts had been stripped. In the mildest cases vomiting of ropy mucus was observed, together with flushed face, dryness of throat and dilated pupils. In the severest cases large quantities of ropy mucus mixed with blood were vomited; the other symptoms were retching, pain in the epigastrium, debility, stupor, extremities cold and pulseless, heart's action feeble and intermittent, pupils dilated, faces of a dusky pallor. These patients were given bismuth subcarbonate and brandy by the mouth, and morphine hypodermically; sinapisms were applied over the stomach and bottles with hot water along the extremities. The patients were discharged from the hospital in two days.

The stem bark has never been examined chemically. Asparagin has been found in the root, and the flowers contain the glucoside robinin, which yields quercetin. The bark deserves investigation in view of the fact that a number of woody leguminous plants are known to contain poisonous alkaloids and other more or less active principles.

Cinchonidine in Quinine sulphate.—Dr. Louis Schæfer, of Mannheim, recommends the following test, which depends upon the very sparing solubility of quinine oxalate in water containing a slight excess of potassium oxalate, and upon the comparatively ready solubility of cinchonidine sulphate in the same liquid: Dissolve 2 gm. crystallized quinine sulphate in a tared flask in 55 ccm. of boiling distilled water; add 0·5 gm. neutral potassium oxalate previously dissolved in 5 ccm. of water; maintain the weight of the contents of the flask at 62.5 gm.; cool for half an hour by placing the flask in water of 20°C. and filter. On adding to the filtrate one drop of caustic soda solution (sp. gr. 1·160), a turbidity or a precipitate of cinchonidine will take place, in case one per cent. or more of cinchonidine sulphate was present in the quinine salt; with smaller quantities of the impurity the filtrate will remain clear.

The same process may also be used for the quantitative determination of cinchonidine, but it is better to work with the following quantities: quinine sulphate 5 gm., distilled water 145 gm., potassium oxalate 1·25 gm. and distilled water 5 gm. The cold liquid is filtered, 100 ccm. of the filtrate mixed with 10 drops soda solution (sp. gr. 1·160), the mixture warmed moderately, then set aside for twelve hours, the precipitate collected on a filter, washed with little water, dried and weighed. To this is added 0·040 gm. (cinchonidine soluble in 100 ccm. of liquid), and by multiplying this sum with 1·750 ($=\frac{3}{2}$ x 1·167) the weight of cinchonidine sulphate contained in 5 gm. of quinine salt is obtained. The results are approximately correct provided the cinchonidine sulphate (anhydrous) does not exceed 10 per cent., in which case the results are decidedly too low.—*Archiv d. Phar.*, Jan., 1887, p. 68.

The diuretic effects of caffeine, which have been previously observed by Zwenger, Gubler, Shapter and others, have recently again been the subject of investigation. The result of von Schroeder's experiments (*Arch. f. Path. u. Pharmak.*, Oct., 1886) point to two opposite effects of caffeine, 1, in stimulating the nervous system, similar to strychnine, and tending to decrease the flow of urine through the contraction of the renal vessels; and 2, in stimulating the kidney itself and thus greatly increasing the amount of urine. That the diuretic action varies considerably in intensity, was observed by Bronne (*Dissertation*, Strassburg, 1886). He administered the alkaloid in divided doses every two hours, 0·5 to 1·5 gm. being the total amount given in the morning only, so as to prevent it from causing sleeplessness; and if its employment must be prolonged, he advises its occasional discontinuance for a few days, when the remedy will act as promptly as before.

Eupatorium Ayapana, Ventenat, is at present met with in European commerce (*Phar. Zts. Russl.*, 1886, p. 707). The drug consists of dried leaves, about 8 cm. long and 15 mm. ($\frac{2}{3}$ inch) broad, brown, smooth, oblong-lanceolate, the margin somewhat revolute. Two prominent lateral veins branch off from the midrib near the base, and extend parallel with the margin to the apex. The odor is slight coumarin-like, and the taste mildly astringent and aromatic. The leaves are recommended against indigestion, pectoral complaints and in cholera, and were used for similar purposes in Europe in the early part of the present century.

The shrub is indigenous to Brazil, but is now found throughout

tropical America and in India. L'Heritier and Martius reported also its efficient use in Brazil against snake bites, the leaves being employed externally and internally.

Eupatorium villosum, Swartz, is indigenous to Jamaica and the Bahamas where it is largely used as a tonic, also as a substitute for hops in beer. Eup. amarissimum is mentioned as being employed in a similar way; the Mexican Pharmacopœia mentions Eup. collinum, *De C.* (See AM. JOUR. PHAR., 1886, p. 169.)

Adulterations of saffron with foreign floral organs or with meat fibres have never been observed by Dr. Niederstadt (*Arch. Phar.*, Jan., 1887, p. 73). A sample of the finest quality of French saffron contained 14 per cent. of moisture and 5·84 per cent. of ash, of which 1 546 per cent. (= 0·058 per cent. of the saffron) was sodium chloride. Four samples of Spanish saffron obtained from Barcelona as pure, contained

Moisture	16·70	15·80	19·80	17·60 per cent.
Ash	10·30 (incl. 1·546 NaCl)	14·65	13·80	14·90 "

Glycerin, which has also been used for increasing the weight, renders the saffron sticky and adhesive to blotting paper. An adulteration with honey is difficult to prove, since saffron contains about 15 30 per cent. of sugar, Dr. Niederstadt having found 13 per cent. On agitating adulterated saffron repeatedly with water, fine needle-shaped fragments of red saunders are separated and may be readily identified from the structure under the microscope. Inferior saffron will give with strong sulphuric acid only a slight blue color, in proportion to the amount of pure saffron present. (For a paper on Spanish saffron see AM. JOUR. PHAR., 1885, p. 487.)

Cazeneuve and Linossier (*Jour. Phar. Chim.*, 1886,) direct attention to the fraudulent sale of exhausted saffron dyed with various artificial coloring matters, some of which are difficult to detect, while others yield with water a red or orange red infusion, which after acidulation with tartaric acid, is a red dye for wool.

Starch and iodine.—Dafert states (*Phar. Zts. Russl.*, 1886, p. 660; *Landw. Jahrb.*, 1885,) that certain starches are not colored blue by iodine. The starch in the millet grains of Panicum miliaceum, *Lin.* var. candidum glutinosum, in contact with iodine solution, is colored yellowish-brown, red-brown or brown, the color disappearing on heating and reappearing on cooling. The cold prepared extract does not give a color reaction with iodine; hence dextrin-like compounds are absent. The reaction with iodine is the only means for distinguishing the above variety of millet from the variety candidum.

VARIETIES.

SUBNITRATE OF BISMUTH AS A DRESSING.—(1) Subnitrate of bismuth possesses antiseptic properties at least equal to those of iodoform. (2) No poisonous effects are to be apprehended, as in the employment of iodoform. (3) The subnitrate of bismuth, being a chemically indifferent substance, does not irritate the wounds; secretion is diminished. (4) Its action is very prolonged, although not vigorous, so that the dressings do not need to be frequently changed, and rest is insured for the wounds. (5) There is no action at a distance, nor does any specific effect attach to it. (6) It does not afford protection against erysipelas and other wound diseases, at least no more than iodoform. (7) It is no disinfectant, but as an antiseptic it keeps the wounds pure. (8) All wounds capable of healing by first intention can do so when dressed with bismuth. (9) It also represents an excellent material for forming scabs under which epidermis can grow over the wound. Its use on granulating wounds has not, however, been sufficiently studied as yet.—*Annals of Surgery.* See also AMER. JOUR. PHAR., 1884, p. 598.

BORO-PHENOL.—This new disinfectant is a combination of borax and carbolic acid, and is intended for antiseptic and disinfecting purposes. The first thing we notice about it is that it has an odor which is really agreeable. This in itself is an immense advance on the old fashioned carbolic acid preparations. We find, too, that it is completely soluble in water, and that it forms a solution which may be used for all the purposes for which the ordinary carbolic acid disinfectants are applicable. The new combination has, however, to be used in very much smaller quantities than the carbolic acid disinfecting powder. —*Quart. Therap. Rev.*, 1887, p. 3.

ANTISEPTIC POWDER.—Lucas-Championière recommends an intimate mixture of equal parts of finely powdered and sifted iodoform, quinine, benzoin, and carbonate of magnesium saturated with oil of eucalyptus. This powder may be applied directly to a wound or over a protective covering, and should be covered with cotton wool, and over this again macintosh should be kept in position by a bandage. After large operations the dressing should be renewed every third day; after small ones it may remain on eight days.—*L'Union Médicale*, December 11, 1886.

CONCENTRIC COMPOSITE PILLS.—J. Mortimer Granville suggests a method of compounding pills, which, he thinks, possesses important advantages. If one desires, for example, to administer one drug which shall be dissolved in the stomach with one which shall be dissolved in the intestine, the core of the pill, which is to be last acted upon, is first made and coated with keratin, which is not acted upon by the acid gastric juice, but dissolves readily in the alkaline fluids of the intestine. The pillule is covered then with the desired quantity of the drug which is to act on the stomach, and is again coated with gelatin or sugar, like ordinary pills —*Brit. Med. Jour.*, Oct. 9, 1886.

PIPERINE has been successfully used in several cases of intermittent fever, which were not cured by quinine. It was given in doses of three to five grains, repeated every hour or every two hours.—*Brit. Med. Jour.*

TANNIN.—MM. Raymond and Arthaud have made some comparative researches on the action of sulphide of carbon, iodoform, and tannic acid in tuberculous patients. Having found that when tannin had been administered

to animals for a month, they were more refractory to the effects of the tubercular virus, it was used in more than fifty cases of tuberculosis in doses of from two to four grammes daily. In less than a fortnight half of the patients showed an increased weight, which continued during the treatment. In acute tuberculosis, both of the child and the adult, the symptoms amended, and the disease retrograded in some cases which had been looked on as hopeless.—*Quart. Therap. Rev.*, 1887, p. 9.

SULPHATE OF SPARTEINE.—Voigt, in the *Wien. med. Blät.*, 1886, Nos. 25 and 27 recounts the experience of the use of this drug in Professor Nothnagel's Klinik and confirms most of the views of Sée (*Am. Jour. of Phar.* 1886, p. 103), Laborde and Legris. It stimulates and regulates the heart, the pulse becomes stronger, and arterial tension is increased. It may be used in valvular disease where there is disturbed compensation, or to quiet irregular action even where the compensation is fairly good. It may likewise be given where, apart from valvular disease, the heart muscle is weak. Laborde and Legris advised $\frac{3}{4}$ to $3\frac{3}{4}$ grains in 24 hours. Voigt recommends doses of $\frac{1}{60}$ to $\frac{1}{30}$ of a grain only. He has known vertigo, headache, palpitation, and nausea follow $\frac{1}{60}$ to $\frac{1}{15}$ of a grain, but these symptoms are only transient, and do not prevent the continuance of the drug. Sometimes a slight narcotic action is observed. Sparteine acts quickly. The effect of one dose may last twenty-four hours. It is well to intermit its administration every few days. The influence, though quickly exerted, is not prolonged enough, Voigt thinks, to remove grave disturbances of the compensation. Repeated doses do not regulate the heart continuously like digitalis, but it is superior to caffeine, adonis vernalis, and convallamerin. It may be given in combination with digitalis.—*Med. Chron.* January, 1887.

THE PHYSIOLOGICAL ACTION OF VANILLIN.—Grasset (*Arch. de pharm.*, Aug., 1886;) has found vanillin fatal to frogs in doses of from three-quarters to nine-tenths of a grain, but has not ascertained that there is a toxic dose for the higher animals. In frogs, it acts chiefly on the spinal cord, its action being that of strychnine, but much milder. It seems to delay putrefactive fermentation. It is antagonized by chloral. Therapeutically, it may be used in doses of three quarters of a grain, as an aid to digestion, especially in atonic and putrefactive dyspepsia, or as a corrigent of drugs which, like chloral, are not well borne by the stomach; also, in doses of from three to four grains, in mucilage, as an excito-motor.—*N. Y. Med. Jour.*, January 29, 1887.

MINUTES OF THE PHARMACEUTAL MEETING.

PHILADELPHIA, February 22d, 1887.

The fifth of the present series of Pharmaceutical meetings was held this day; Mr. Wm. B. Webb being called to preside.

The minutes of the last meeting were read, and there being no corrections to be made they stand approved.

The actuary presented to the library from Messrs. Carpenter, Henszey & Co., a copy of the Medicine Chest Dispensatory published by Mr. G. W. Carpenter in 1836; from the Publishing Committee, the 4th edition of the Microscopist, by Dr. J. H. Wythe; from the British Pharmaceutical Conference

the Year Book of Pharmacy for 1886, and the Calendar of the Pharmaceutical Society of Great Britain for 1887. This last work contains a historic sketch of the society, its charter, the pharmacy act, supplements thereto, by-laws, the members and officers of the council, committees, boards of examiners, lists of officers from its formation, professors of the society, list of members, associates, registered apprentices, regulations of the board of examiners, the privileges of the society, the prizes, scholarship, lists of the prizemen and an account of the benevolent fund.

Mr. C. S. Bondurant, of St. Louis, Mo., a member of the senior class, read a paper upon *Hydrangea arborescens*, which was referred to the committee of publication. Several of the principles obtained in the investigation were exhibited and a test illustration was made, showing the peculiar fluoresence produced by an alkali (ammonia).

Mr. E. S. Beshore, of Pottstown, Pa., also a member of the senior class, read a paper upon *Chimaphila umbellata*. This also was referred to the publication committee. The results of the reactions described in this paper were exhibited to the meeting.

Mr. F. X. Moerk read a paper upon *subiodide of bismuth*, in which he detailed a variety of processes and exhibited the results of them.

Mr. Rosengarten stated that the experiments of Mr. Moerk confirmed his own in regard to the impossibility of obtaining the pure subiodide by the processes recently published; he was glad to have had the opportunity of hearing the paper. The paper was referred to the committee on publication.

Prof. Maisch called attention to the *kombé poison*, from Africa, the product of a species of *Strophanthus*, noticed in AMERICAN JOURNAL OF PHARMACY, 1886, p. 405, and exhibited specimens obtained from Messrs. Burroughs, Wellcome & Co., of London, and more recently from Prof. J. U. Lloyd, of Cincinnati. The drug consists of the entire fruit, of which the pericarp and the feathery seedcrown must be rejected in the preparation of the tincture, which Prof. Fraser directs to be prepared from the seed, previously deprived of the fixed oil. The active principle strophanthin is found chiefly in the seeds, and, the hairy portion contains the alkaloid ineine which has an entirely different physiological action. That the pods and hairs are likewise poisonous has been shown by Mr. Martindale, in a paper recently published (See AMER. JOUR. PHAR., 1887, p. 99).

Prof. Maisch also exhibited a specimen of *asafetida* which had been sent to him by Messrs. Roller & Shoemaker. It differs in appearance from the drug as usually seen in our market, and consists almost entirely of agglutinated tears, the fresh fracture being milk-white, but the entire surface of the mass becoming, on exposure, of a bright pink color.

The actuary exhibited some specimens of *fruit juices* sent by Messrs. Hance Brother & White, who prepare them very largely, also samples of the syrups made from them; they were of their usual excellence. The exhibit caused a great deal of interesting conversation about the methods of preparing and preserving such juices. It was stated by Prof. Remington that many of the juices, if put into bottles quite hot and filled to the cork, then

secured and kept in a cool place, would keep several years unimpaired. In some cases a few grains of boric acid had been added, but this was not necessary.

Professor Remington asked what was the experience of the members about *keeping lemons* in good condition for neutral mixture. Some members said, that wrapping them in paper, or keeping them in a cool cellar in a box to which the air had free access, would preserve them two or three weeks in good condition. Professor Remington stated that a solution of table salt about the density of sea water would be found effectual for their preservation for five or six weeks at a time; before the juice is expressed, the lemons are well washed with water.

A Syrup of Gooseberries as a most excellent vehicle for the administration of Iodide of Potassium was mentioned. In the absence of the fresh fruit or of the preserved juice, the syrup may be made of a jar of Muir's jam of gooseberries to a quart of syrup.

A very neat article for facilitating the work of the dispenser in *numbering prescriptions* was exhibited by Mr. Evan T. Ellis. It consists of a tape on which the numbers are printed in duplicate and rolled upon a spool which is enclosed in a case fastened near the counter; there is attached to it a cutter by which the pair of numbers can be cut off as needed, one of which is affixed to the prescription and the other to the vessel or package in which the medicine is to be sent out. As no two prescriptions can thus have the same number a great source of danger is obviated. After a good deal of conversation it was thought that the device was one which would be of advantage if adopted; it can be had at Mr. Ellis's office, 123 Chestnut street.

The exhibition of this numbering apparatus called forth considerable discussion about the check system in connection with prescriptions, when the opinion was generally expressed that no system should be permitted to supersede the constant vigilance that was necessary in connection with every step in the dispensing of medicine.

Professor Maisch showed a little *pencil for erasing ink stains* which had been sent to him. It was examined by Professor Trimble, and found to be a roll of paper tightly compressed and saturated with citric acid. It is applied to the moistened ink spot with a little solution of chlorinated lime.

There being no further business, on motion adjourned.

T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The California College of Pharmacy held its fourteenth annual commencement at Odd Fellows Hall, San Francisco, on November 17, 1886 nine candidates receiving the diploma of Graduate in Pharmacy from the hands of President Holden. Addresses were made by W. M. Searby, Ex-president of the College; by C. C. Stratton, D. D., president of the University of the Pacific, and by Professor E. W. Runyon, Ph. G.

At the annual meeting of the Alumni Association of the same college the usual business was transacted, after which the meeting adjourned to partake of the annual banquet.

The Chicago College of Pharmacy held its twenty-second annual commencement in Attfield Hall of the college building when the diploma of Graduate of Pharmacy was bestowed upon forty-four gentlemen.

The exercises on this occasion were of a very interesting and pleasant character; addresses were made by Hon. Ex-Mayor Gilbert, members of the faculty and of the profession, and were responded to by the valedictorian of the class. In the evening the faculty and alumni tendered to the graduating class and some invited guests a banquet at the Palmer House. Covers were laid for 150, and after due justice had been done to the menu, toasts, speeches and gay repartee were indulged in until a late hour.

The Kings County, N. Y., Pharmaceutical Society gave a course of lectures during the winter of 1885–86, which were so well attended that a similar course has been arranged for the present winter, is now in progress since November and will continue until spring. The lectures are being delivered by members of the society and others.

The Rhode Island Pharmaceutical Association held its twelfth annual meeting in Providence, January 12. Among the reports was one stating that a course of lectures on chemistry was given under the auspices of the Association, and was attended by twenty-five young men. The officers elected for the current year are F. J. Phillips, president; A. W. Wellington, secretary; and A. W. Farmer, Jr., treasurer.

The Illinois Pharmaceutical Association held a special meeting in Springfield on January 13th and 14th with the view of considering amendments to the pharmacy law. The amendments adopted with the view of submitting them to the legislature contemplate:

1st. To pay the expenses of the State Board of Pharmacy and thus do away with the annual registration fee.

2d. To abolish diploma distinctions, so that all persons asking registration in future will be compelled to demonstrate their ability as practical pharmacists.

3d. To so amend the pharmacy law that none but registered pharmacists shall be allowed to sell *any kind* of drugs, medicines, or poisons.

4th. To give registered assistants the privilege of registering as pharmacists.

5th. To exempt pharmacists from jury duty.

6th. To provide for the issuing of a minor certificate, and separation of the office of Secretary and Treasurer of the Board of Pharmacy.

7th. To empower the Board to elect their Secretary either from or outside of their membership, as in their judgment, will be for the best interest of all concerned.

The Connecticut Pharmaceutical Association met in annual meeting at Meriden February 1st and 2d, at which the address of the president and the usual reports of the officers and committees were presented. Several papers were read, and a number of pharmaceutical and chemical preparations were exhibited by the members, for which prizes were awarded.